

# Commercial and technology developments in sustainable manufacturing

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## **TMM Europe Targets**

1. Energy usage
2. Water usage
3. Volatile Organic Compounds (VOCs)  
released from painting operations
4. Waste to landfill
5. Degree of compliance with  
environmental regulations
6. Number of complaints from external  
(neighbourhood) parties

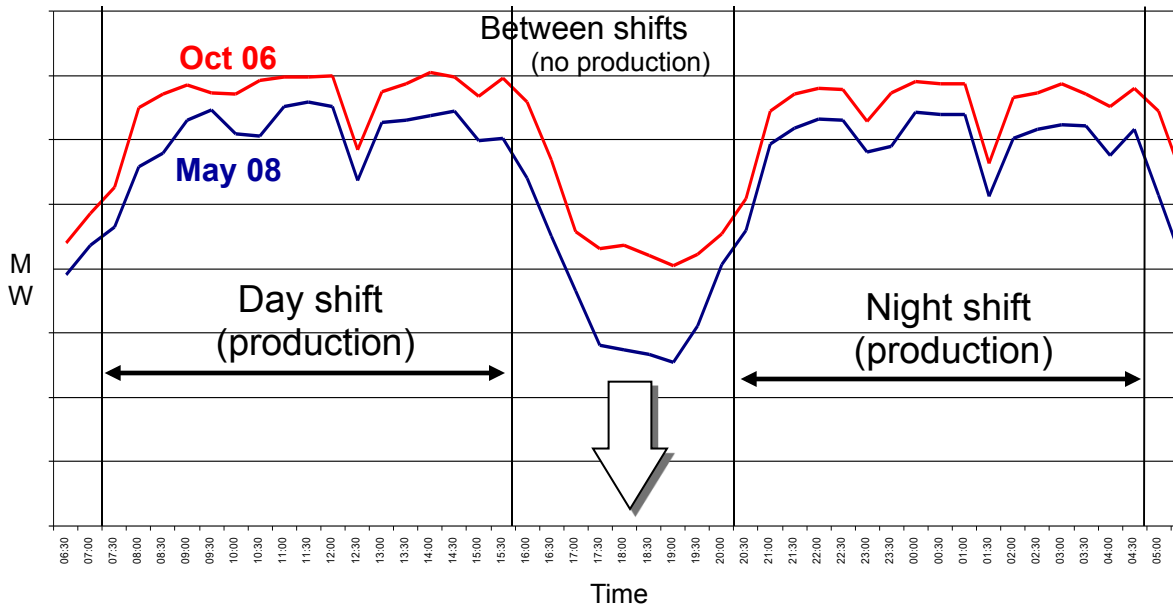
## **Actual (2001-2006)**

1. - 44%
2. - 37%
3. - 32%
4. - 99%
5. **All plants ISO14001**

# Examples of Leadership Energy reduction

## Inter-shift shutdown focus

Burnaston Plant site electrical loading



**Target: no production = no energy use**

**Weld Shop energy focus**

The image shows two signs for energy switch observation points. The left sign is titled 'ENERGY SWITCH OBSERVATION POINT' and lists items to be checked: LIGHT SWITCHES, FAN SWITCHES, and PORTABLE FAN SWITCHES. The right sign is titled 'RESPONSIBLE GROUP' and lists items to be checked: 1<sup>ST</sup> BREAK, LUNCH, 2<sup>ND</sup> BREAK, and End Of Shift. Below the signs is a photo of an employee in a white lab coat operating a machine.

- Employees responsible for switch off
- Energy switch observation points
- Clear instructions for switch off times
- Local ownership of energy control

# Where are the Key Challenges?

How to make current products in a low-carbon, resource efficient manner.

How to transform our factories and products.

Explore how the entire industrial system might change

- 🌍 Eco-efficiency
- 🌍 Eco-technology & eco-factory
- 🌍 Sustainable industrial systems

# Sustainable Manufacturing Opportunities

Material Substitution

Primary process technology improvement

In-direct process technology improvement

Modeling, measurement & management tools

Energy, energy, energy – waste, waste – water - resource

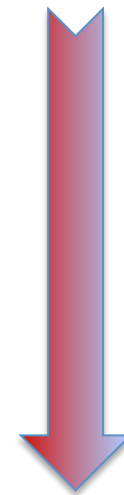
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Closeness to customer

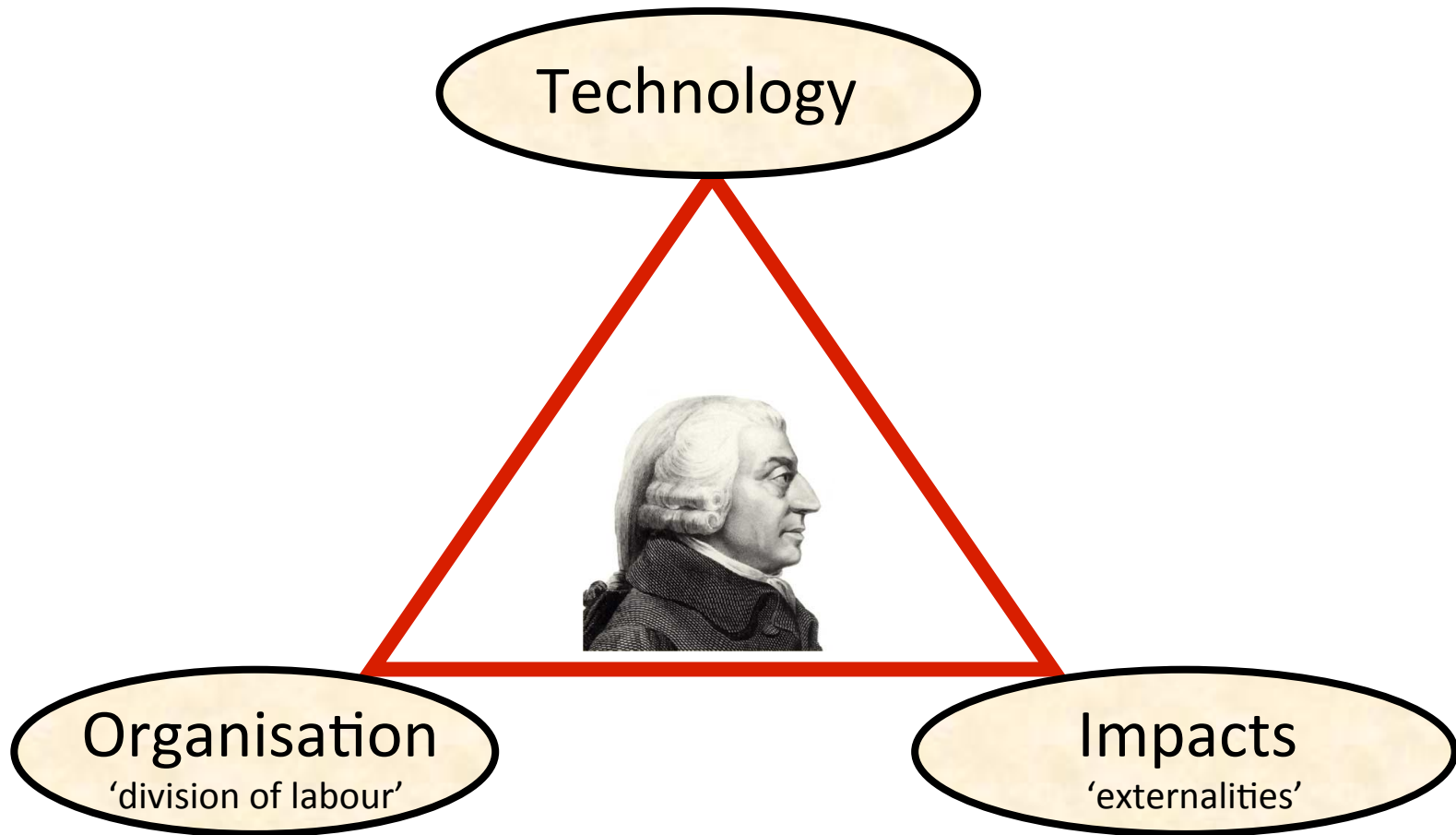
Impact

Risk



Energy, energy, energy – waste, waste – water - resource

# The end of a dominant industry model?



# Sustainable Manufacturing Opportunities

Material Integration	(wool as fire-retardant)
Material cycles	(PET to fleece)
Process substitution	(re-shape vs re-melt)
Service based business models	(waste contracting)
Shared Value	(M&S/Oxfam; BGB/PV)

# Important characteristics of industrial sustainability as an emerging market

proof of performance as seen by purchaser

intellectual property protection

scaling/volume risks

sector history of innovation

moments of opportunity (e.g. re-furbishment)



# Sustainable Manufacturing Innovation

Or should it be:

Manufacturing & (a little bit of) Sustainable Innovation?

# Messages

Low carbon innovation asks little of the stakeholders.

Target your audience carefully –  
who is the purchasing decision-maker?

High innovation often changes the system, needs design thinking. Must look compelling.

Almost all manufacturers are under severe pressure to improve environmental performance.